threads points to their value as a means of conducting food material to the developing cork.

In the phloem there is a sharp contrast between the starch-containing medullary ray cells and bast parenchyma on the one hand, and the sieve tubes on the other, and no threads can be found directly connecting the parenchymatous cells with the sieve tubes, but the albuminous cells of the ray possess numerous thread groups which communicate with both tissues. The starch medullary ray cells in the phloem and xylem possess numerous threads in the tangential and basal walls, especially in the former, and are also united with the bast parenchyma and albuminous cells.

The sieve tube threads which occur only in the radial walls always show a median dot.

The existence of threads in the xylem is doubtful. All living parenchymatous cells show them, but it seems probable that they quickly disappear when the cells become lignified. In the case of young bordered pits there is some evidence that the torus is traversed by connecting threads which are soon obliterated.

The leaf of *Pinus sylvestris* shows a distribution of connecting threads similar to that noticed in the cotyledon. The endodermis is seen to be an important layer connecting the tissues of the stele with those of the cortex by means of thread groups in the tangential walls. In the pericycle there are both dead and living cells, but no threads persist in the walls connecting the dead with the living cells.

The albuminous cell thread groups are very well developed, and their function and peculiar properties are discussed.

In conclusion, the general distribution of the connecting threads throughout the tissues is considered.

"On the 'Blaze Currents' of the Frog's Eyeball." By A. D. Waller, M.D., F.R.S. Received December 6,—Read December 6, 1900.

(Abstract.)

The normal electrical response to light is positive. The normal electrical response to every kind of stimulus is positive. The normal response of the frog's eyeball is partly retinal, partly by other tissues. The direction of response is reversed by pressure.

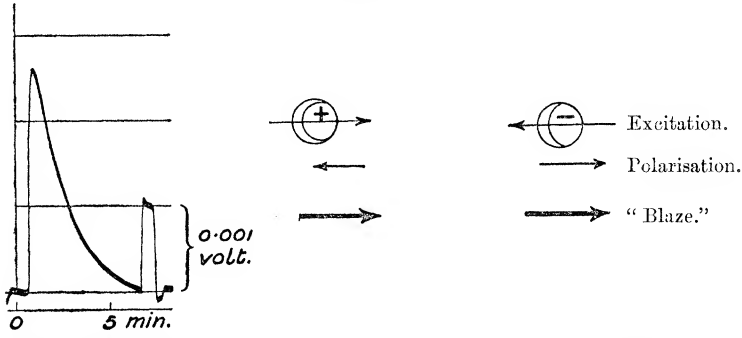
The normal "blaze currents" excited by single induction shocks, and by condenser discharges, are comparable with the normal discharges of an electrical organ. Their maximum voltage is of the same order as that of the discharge of a single electrical disc (over

0·03 volt). Their magnitude and duration increase with increased strength of excitation.

Summation of stimuli, summation of effects, staircase increase, and fatigue decline are manifested by blaze currents. Stimulation of excessive strength abolishes them completely, but only temporarily.

The energy of a blaze effect may considerably exceed the energy of its exciting cause. The effects are observable for at least five days after excision of the eyeball; they appear to be diminished under prolonged illumination, and increased under prolonged darkness.

Fig. 1.



Positive response to a single induction shock sent through the eyeball in the positive (upward) direction.

The influence of raised temperature and increased pressure is studied, and under the influence of the latter four types of response are recorded.

Comparison is made between blaze currents and the responses of electrical organs as described by du Bois Reymond.

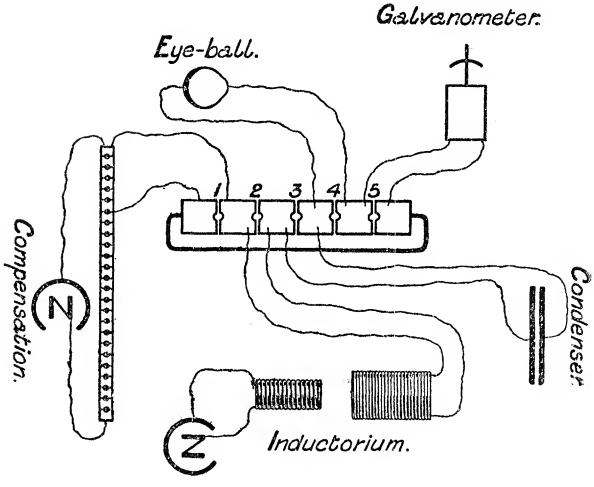
During and after maximal blaze the resistance diminishes; the diminution is not irreciprocal.

If single electrical currents are passed through a normal eyeball and a galvanometer, in a "homodrome" and in a "heterodrome" direction (*i.e.*, with and against the direction of normal discharge), the homodrome (positive) deflection is greater than the heterodrome (negative) deflection. This inequality is the result of positive blaze current, and is abolished by death or strong tetanisation. In the latter case the abolition is temporary.

The normal electrical response to light persists undiminished at a time when blaze currents have been abolished by tetanisation. On the other hand, blaze current may be present in an eyeball giving no response to light. The altered state of the eyeball in relation to light does not necessarily run parallel with its altered state in relation to electrical stimuli.

Direction of exciting — current.		Direction of organ response.	
		Living.	Dead.
Torpedo	Dorsum + ↑ Venter	+ ↑	− ↓
	Dorsum − ↓ Venter	+ ↑	+ ↑
Eyeball	Cornea + ↑ Fundus	+ ↑	− ↓
	Cornea − ↓ Fundus	+ ↑	+ ↑

FIG. 2.



Plan of circuit.